

Claims

- [c1] 1. A dual slope analog to digital converter, comprising:
- a first operational amplifier;
 - an integrator;
 - a comparator, whose positive input is coupled to the output of the integrator;
 - a resistor coupling the output of the first operational amplifier and the first input of the integrator; and
 - a first capacitor coupling the first input of the integrator and the negative input of the comparator,
- wherein a plurality of couplings are controlled by a plurality of switches, comprising:
- a first coupling, controlled by a first set of switches, for optionally forming a negative feedback loop for the first operational amplifier;
 - a second coupling, controlled by a second switch, for optionally forming connection between the negative input of the comparator and the positive terminal of the first operational amplifier, and
 - a third coupling, controlled by a third switch, optionally forming connection of feedback loop from the output of the comparator to the positive terminal of the first operational amplifier.

- [c2] 2.The dual slope analog to digital converter as recited in claim 1, wherein the integrator at least comprises:
a second operational amplifier, having a positive input terminal that is coupled to an analog ground voltage;
a second capacitor, being negatively feedback looped of the second operational amplifier.
- [c3] 3.The dual slope analog to digital converter as recited in claim 1, wherein the couplings are controlled for a plurality of phases, comprising:
an offset cancellation phase, wherein the first coupling is on, the second coupling is on, and the third coupling is on;
an integration phase, wherein the first coupling is on via a first capacitor supplying a first voltage across which, the second coupling is on, and the third coupling is off;
a discharge phase, wherein the first coupling is on via the first capacitor supplying a second voltage across which, the second coupling is on, and the third coupling is off; and
a charge reset phase, wherein the first coupling is on, the second coupling is off, and the third coupling is on.
- [c4] 4.The dual slope analog to digital converter as recited in claim 1, wherein the comparator comprises a third operational amplifier.

[c5] 5.A dual slope analog to digital converter, comprising:
a first operational amplifier;
a comparator, whose positive input is coupled to an analog ground;
a first resistor, coupling a first pin an output of the first operational amplifier;
a first capacitor, coupling negative input of the comparator and the first pin and
a second capacitor, coupling the first pin and a ground, wherein a plurality of couplings are controlled by a plurality of switches, comprising:
a first coupling, controlled by a first set of switches, for optionally forming a negative feedback loop of the first operational amplifier,
a second coupling, controlled by a second switch, for optionally forming connection between positive input terminal of the first operational amplifier and negative input terminal of the comparator, and
a third coupling, controlled by a third switch, for optionally forming a negative feedback loop from the output of the comparator to the positive terminal of the first operational amplifier.

[c6] 6.The dual slope analog to digital converter as recited in claim 5, wherein the comparator comprises a second operational amplifier.

[c7] 7. The dual slope analog to digital converter as recited in claim 5, wherein the couplings are controlled for a plurality of phases, comprising:

- an offset cancellation phase, wherein the first coupling is on, the second coupling is on, and the third coupling is on;
- an integration phase, wherein the first coupling is on via a third capacitor supplying a first voltage across which, the second coupling is on, and the third coupling is off;
- a discharge phase, wherein the first coupling is on via the third capacitor supplying a second voltage across which, the second coupling is on, and the third coupling is off; and
- a charge reset phase, wherein the first coupling is on, the second coupling is off, and the third coupling is on.